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| 10/567,339 | 11/30/2006 | Yoshitaka Hara | 285598US2PCT | 5325 |

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| EXAMINER |
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PATEL, NIMESH

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| ART UNIT | PAPER NUMBER |
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2617

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01/25/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/567,339

Applicant(s)

HARA ET AL.

Examiner

NIMESH PATEL

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-24 is/are rejected.
- 7) ☒ Claim(s) 25 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Oct. 29, 2010 for claims 21 - 26 has been entered. Claims 1 – 20 are canceled.

Response to Arguments

2. Applicant's arguments filed on Oct. 29, 2010 with respect to claims 21 - 26 have been considered but they are not persuasive.

The Applicant's argument, "Trikkonen cannot possibly calculate signal quality based on output signals being transmitted simultaneously because Trikkonen, does not disclose signals as transmitted simultaneously. Whether Walton discuss the simultaneous transmission of output signals is irrelevant to establishing a prima facie case of obviousness", on page 7, lines 21 – 25.

The examiner's response, "Trikkonen discloses, transmitter is controlled in dependence on at least one parameter of the transmitter, at least one parameter of receiver and at least one parameter of a wireless environment between

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transmitter and receiver – ABSTRACT, paragraphs 0012 - 0023, 322, 140, and 309, at the same time paragraph 108 mentions the use of different modulations; paragraph 118, 256, 248, 252. The matrix W provides weights to the different beams which take into account for example the condition of the channel. The state of the channel can be derived from the open and/or closed loop measurements. This function is provided by the associated matrix generating and applying circuitry – paragraph 0322.

Walton teaches, multiple-access multiple-input multiple-output MIMO communication system, and simultaneous transmission. The data streams may be simultaneously transmitted by the base station from transmit antennas and targeted to one or more terminals, each equipped with receive antennas (Figs. 1 - 11C, paragraphs 4, 10 – 15, 72, 81, 82, 242, 338, 353, 385, 462, 467, 509).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to modify the transmitting and receiving method of Trikkonen (Trikkonen, Fig. 2), wherein, the base transceiver station 2 of Trikkonen, would have incorporated the simultaneously transmission by the base station of Walton (Walton (Figs. 1 – 11C, paragraphs 4, 10 – 15, 72, 81, 82, 242, 338, 353, 385, 462, 467, 509), for the data rate can be increased by transmitting independent information streams form different antennas but using he same channel as

defined by frequency, time slot and/or spreading code (Trikkonen, paragraphs 4, 5, 6 and Walton, paragraphs 4, 72, 467)".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 21 – 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Trikkonen US PGPub: US 2004/0002364 A1 Jan. 1, 2004, and in view of Walton US PGPub: US 2003/0125040 A1 Jul. 3, 2003.

Regarding claim 21, Trikkonen discloses,

a radio communication method by a radio communication system (fig. 2) in which output signals are generated from a plurality of information signals and then transmitted to a system of communication partner from a plurality of antennas (fig. 2, item 105), the method comprising

receiving control information transmitted by the system of the communication partner (paragraph 91, 304, 307, fig. 4a and 4b; the loop transmissions contain control information);

determining, based on the received control information, a first weight corresponding to the plurality of antennas for a first signal of the plurality of information signals modulated by a first modulation scheme and encoded by a first encoding method, and a second weight corresponding to the plurality of antennas for a second signal of the plurality of information signals modulated by a second modulation scheme and encoded by a second encoding method

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(paragraphs 322, 140, and 309, at the same time paragraph 108 mentions the use of different modulations; paragraph 118, 256, 248, 252. Transmitter is arranged to multiply a stream of symbols to be transmitted by transforms to generate a resultant transformation used in the generation of beams, along with different modulations, reads on the claimed first and second signals – paragraph 0012 – 0013, 0077, 0164, 0284);

generating a first operation result by multiplying the first signal by the first weight, and generating a second operation result by multiplying the second signal by the second weight (paragraphs 322, 140, and 136. Transmitter is arranged to multiply a stream of symbols to be transmitted by transforms to generate a resultant transformation used in the generation of beams, along with different modulations – paragraph 0012 – 0013, 0077, 0164, 0284); and

generating, based on the first operation result and the second operation result, a plurality of the output signals each corresponding to one of the plurality of antennas, and transmitting the plurality of the output signals to the system of the communication partner (paragraphs 126 and 17),

wherein the control information comprises a weight information on the first and second weights and a transmission format information, on modulation scheme and encoding method, corresponding to the weight information (paragraphs 140, 136, 322, 140, and 309 and 322, at the same time paragraph 108 mentions

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the use of different modulations; paragraph 118, 256, 248, 252), the modulation scheme and encoding method corresponding to the transmission format information being determined based on the signal quality (paragraphs 87 – 90, 95, 96, 184, 193, 204, 290, 313) calculated on the assumption that the output signals of the plurality of antennas are generated utilizing the weights corresponding to the weight information (paragraphs 4, 5, 129, 134, 136, 149),

but, does not clearly teach, the information is “the output signals are transmitted simultaneously”.

Walton teaches, multiple-access multiple-input multiple-output MIMO communication system, and simultaneous transmission. The data streams may be simultaneously transmitted by the base station from transmit antennas and targeted to one or more terminals, each equipped with receive antennas (Figs. 1 - 11C, paragraphs 4, 10 – 15, 72, 81, 82, 242, 338, 353, 385, 462, 467, 509).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to modify the transmitting and receiving method of Trikkonen (Trikkonen, Fig. 2), wherein, the base transceiver station 2 of Trikkonen, would have incorporated the simultaneously transmission by the base station of Walton (Walton (Figs. 1 – 11C, paragraphs 4, 10 – 15, 72, 81, 82, 242, 338, 353, 385, 462, 467, 509), for the data rate can be increased by transmitting independent

information streams form different antennas but using the same channel as defined by frequency, time slot and/or spreading code (Trikkonen, paragraphs 4, 5, 6 and Walton, paragraphs 4, 72, 467).

Regarding claim 22, Trikkonen discloses,

the radio communication method according to claim 21, wherein the control information further comprises information to select the first and second weights from a number of weight candidates greater than a number of the antennas (the practical rank number PRN thresholds can be selected by an operator on a cell by cell basis and based on either forecasted information or measured interference levels or traffic statistics. Within a cell, different users may have different thresholds, based on e.g. the type of subscription, and the equipment the user makes the communications link with - paragraphs 89, 91, 122, 304, 307, fig. 4a and 4b; the loop transmissions contain control information).

Regarding claim 23, Trikkonen discloses,

a radio communication system (fig. 2) in which output signals are generated from a plurality of information signals and then transmitted to a system of communication partners from a plurality of antennas (fig. 2, item 105), comprising:

a reception device for receiving control information transmitted by the system of the communication partner (paragraph 91, 304, 307, fig. 4a and 4b; the loop transmissions contain control information);

a weight determining device to determine, based on the received control information, a first weight corresponding to the plurality of antennas for a first signal of the plurality of information signals modulated by a first modulation scheme and encoded by a first encoding method, and a second weight corresponding to the plurality of antennas for a second signal of the plurality of information signals modulated by a second modulation scheme and encoded by a second encoding method (paragraphs 322, 140, and 309, at the same time paragraph 108 mentions the use of different modulations; paragraph 118, 256, 248, 252. Transmitter is arranged to multiply a stream of symbols to be transmitted by transforms to generate a resultant transformation used in the generation of beams, along with different modulations, reads on the claimed first and second signals – paragraph 0012 – 0013, 0077, 0164, 0284);

an operation device to generate a first operation result by multiplying the first signal by the first weight, and to generate a second operation result by multiplying the second signal by the second weight (paragraphs 322, 140, and 136. Transmitter is arranged to multiply a stream of symbols to be transmitted by

transforms to generate a resultant transformation used in the generation of beams – paragraph 0012 – 0013, 0077, 0164, 0284); and

a transmission device to generate, based on the first operation result and the second operation result, a plurality of the output signals each corresponding to one of the plurality of antennas, and to transmit the plurality of the output signals to the system of the communication partner (paragraphs 126 and 17), wherein the control information comprises weight information on the first and second weights and a transmission format information, on modulation scheme and encoding method, corresponding to the weight information (paragraphs 140, 136, 322, 140, and 309 and 322, at the same time paragraph 108 mentions the use of different modulations; paragraph 118, 256, 248, 252), the modulation scheme and encoding method corresponding to the transmission format information being determined based on the signal quality (paragraphs 87 – 90, 95, 96, 184, 193, 204, 290, 313) calculated on the assumption that the output signals of the plurality of antennas are generated utilizing the weights corresponding to the weight information (paragraphs 4, 5, 129, 134, 136, 149), but, does not clearly teach, the information is “the output signals are transmitted simultaneously”.

Walton teaches, multiple-access multiple-input multiple-output MIMO

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communication system, and simultaneous transmission. The data streams may be simultaneously transmitted by the base station from transmit antennas and targeted to one or more terminals, each equipped with receive antennas (Figs. 1 - 11C, paragraphs 4, 10 – 15, 72, 81, 82, 242, 338, 353, 385, 462, 467, 509).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to modify the transmitting and receiving method of Trikkonen (Trikkonen, Fig. 2), wherein, the base transceiver station 2 of Trikkonen, would have incorporated the simultaneously transmission by the base station of Walton (Walton (Figs. 1 – 11C, paragraphs 4, 10 – 15, 72, 81, 82, 242, 338, 353, 385, 462, 467, 509), for the data rate can be increased by transmitting independent information streams form different antennas but using he same channel as defined by frequency, time slot and/or spreading code (Trikkonen, paragraphs 4, 5, 6 and Walton, paragraphs 4, 72, 467).

Regarding claim 24, Trikkonen discloses,

the radio communication system according to claim 23, wherein the control information further comprises information to select the first and second weights from a number of weight candidates greater than a number of the antennas (the practical rank number PRN thresholds can be selected by an operator on a cell by cell basis and based on either forecasted information or measured

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interference levels or traffic statistics. Within a cell, different users may have different thresholds, based on e.g. the type of subscription, and the equipment the user makes the communications link with - paragraphs 89, 91, 122, 304, 307, fig. 4a and 4b; the loop transmissions contain control information).

Allowable Subject Matter

4. The combined claims 25 and 26 are objected to as being dependent upon a rejected base claim 21, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The entire prior-art combination disclosed fails to anticipate or render the claimed limitations of combined claims 25 and 26 in combination with all the recited limitations of the disclosed independent claim 21 obvious (viewed the entire claim as a whole), over any of the prior art of record, alone or in combination.

Contact Information

Any inquiry concerning this communication from the examiner should be directed to Nimesh Patel at (571) 270-1228, normally reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rafael, Perez-Gutierrez, can be reached at (571) 272-7915.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Nimesh Patel /
Patent Examiner (2617)